Claims

1. A nucleic acid construct comprising:

   (i) a sequence encoding an immunoglobulin heavy chain,

   (ii) a sequence encoding an immunoglobulin light chain, and

   (iii) one or more promoters capable of controlling expression of both sequences in a plant,

   wherein both said sequences contain a multivariable region in which preselected parts of said regions, which affect the encoded antibodies' ability to bind to variants of the target antigen, have been altered by exchanging, inserting or deleting one or more nucleotides as compared to the original said immunoglobulin sequence.

2. The nucleic acid construct as claimed in claim 1, wherein the promoter in (iii) is a dual promoter.

3. The nucleic acid construct as claimed in claim 2, wherein said dual promoter is *mas1'2'* from the *A. tumiefaciens* Ti plasmid.

4. The nucleic acid construct as claimed in any one of claims 1 to 3 further comprising any one or more selected from terminators, enhancers, promotors, or sequences to enable cloning and/or purification of the protein.

5. A vector containing the nucleic acid construct of any one of claims 1 to 4.

6. The vector as claimed in claim 5 wherein said vector is C2200-DP-HC-LC.

7. A plant cell comprising a nucleic acid construct as defined in any one of claims 1 to 4 or a vector as claimed in claim 5 or claim 6.

8. A whole plant, or part thereof comprising a plant cell as defined in claim 7.

9. The seed, and/or propagating material of a plant as claimed in claim 8.

10. A method for the production of populations of antibodies comprising construction of nucleic acid constructs of claims 1 to 4, or vectors of claim 5 or claim 6, and the expression of said nucleic acids or vectors in plants.

11. A method according to claim 10 wherein said plants allows posttranslational modifications and/or overproduction of said immunoglobulin proteins.

12. A method according to claim 10 or claim 11 wherein post-translational modifications of the antibodies are carried out in the plants *in vivo.*

13. A method according to claim 10 or claim 11 wherein post-translational modifications of the antibodies are carried out *in vitro.*

14. A method according to claims 10 to 13 further comprising a method for selecting plants producing antibodies that bind to a specific protein, or fragment thereof, comprising the following steps:

(a) purify recombinant antibodies from a pool of plants expressing said antibodies;

(b) assay said antibodies to determine whether any bind to the specific protein or fragment thereof;

(c) and if the results of step (b) are positive, repeating steps (a) and (b) with the pool of plants sub divided into smaller groups; and

(d) repeating steps (a) to (c) until the plant producing the antibody that binds the specific protein or fragment thereof is identified.

15. The method as claimed in claim 14 wherein the initial pool contains 1000 plants, which is subdivided by a factor of ten in step (c).

16. The method as claimed in claim 14 or claim 15 wherein the assay of step (b) is carried out by means of ELISA.

17. The method as claimed in any one of claims 14 to 16 wherein the specific protein is a viral protein.

18. The method as claimed in claim 17 wherein the protein is an HIV virus protein.

19. The method as claimed in claim 18 wherein said protein is an HIV-1 envelope protein.

20. A pharmaceutical composition comprising an antibody identified by the method as claimed in any one of claims 14 to 19.

21. The use of a nucleic acid molecule as claimed in any on of claims 1 to 4, or a vector as claimed in claim 5 or 6 in the production of a transgenic plant.